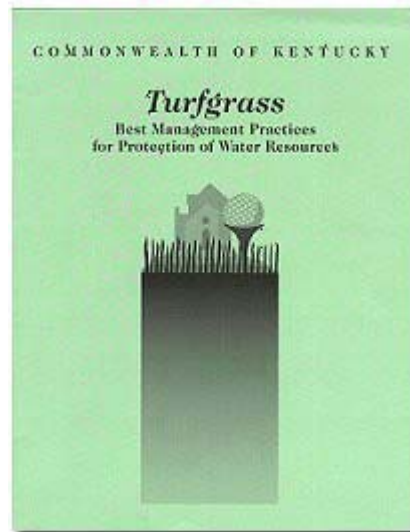


Turfgrass Best Management Practices For Protection of Water Resources

Project Description: The wide variety of chemicals used to grow turfgrass for golf courses and lawns have a significant impact on water quality. Approximately 12 different chemicals (pesticides, fertilizers, etc.) are used to treat some portion of a golf course during the year. Lawn treatment firms use around five different chemicals, including the more mobile 2,4-D and Diazinon. The turfgrass industry uses scouting as an indicator for timing of pesticide application. Through this project, a manual of best management practices (BMPs) that may be used to initiate chemical applications to turfgrass was developed.

The turfgrass BMPs manual provides information and guidance on turfgrass management practices to decrease adverse affects on the water resources of the Commonwealth. These activities cover establishment of new turf, nutrient management, pest management, irrigation, and construction activities. Turf managers should use the manual as general guidance, whereas some situations may require more specific measures to protect sites with high-risk surface-and groundwater resources.

The protection of water resources is accomplished though the use of turf-care practices that use technology developed through research and practical experience of turf-care professionals. A specific concern is protection of water resources from nonpoint source (NPS) pollution resulting from application of pesticides and nutrients. Movement of fertilizers or pesticides off-site or downward to the ground water in response to irrigation or rainfall may create environmental problems. These possibilities can be greatly reduced by developing low-risk irrigation, fertilizer, and pesticide programs, and insuring that these programs are administered by a qualified turf manager or knowledgeable homeowner.



After weather, cultural practices are the single biggest factor in dictating the severity of pests. The most important cultural practices are mowing, fertility management, and irrigation. Mowing height has a tremendous impact on the severity of weed and disease pests. Lowering the height increases weed and disease pressure on turf grasses by decreasing competition and causing turf stress. Inadequate fertilization results in a stressed turf that is more susceptible to weeds and diseases. Once weeds are present, several chemical applications may be required to alleviate problems that would not have occurred under a proper fertilization and mowing program.

The goals of Turfgrass BMPs are to reduce NPS pollution by the following methods:

- Reduce off-site transport of sediment, nutrients, and pesticides.
- Control the rate, method, and type of chemical being applied.
- Reduce total chemical loads by use of Integrated Pest Management (IPM), economic thresholds, alternate pest control options, and fertility testing.
- Use both biological and mechanical Soil and Water Conservation Practices. BMPs suggested by the U. S. Department of Agriculture, Soil Conservation Service can be adapted for use in turfgrass management situations.

Some of the commonly Used BMPs for turf management are:

Grassed waterway or outlet--a natural or constructed waterway or outlet maintained with vegetative cover to prevent soil erosion and filter nutrients.

Critical area planting -- planting vegetation to stabilize the soil and reduce erosion and runoff. Turfgrasses are the premium choice of plants for this purpose.

Resistant crop varieties -- use of plant varieties that are resistant to insects, nematodes, diseases, etc., in order to reduce pesticide use. Care should be taken to select the turfgrass species and cultivar best adapted to the environmental conditions of a site.

Cultural control of pests -- using cultural practices as a management tool to reduce pesticide use. Cultural practices include mowing, fertilization, irrigation, and supplementary cultural practices such as aeration, dethatching and rolling. These turfgrass activities should be included in the management plan to take advantage of every aspect of cultural control of pest problems.

Soil testing -- testing to avoid over fertilization and loss of nutrients. A soil test should be taken on a regularly scheduled basis, at least every one to three years.

Timing and placement of fertilizer-- timing fertilization for maximum plant use and minimum leaching or movement by surface runoff.

Slow release fertilizer -- appropriate use of slow release fertilizers to reduce nitrogen losses from soils prone to leaching. All fertilization programs should include slow release fertilizers or minimal rates of soluble fertilizers where applicable.

Irrigation water management -- determining and controlling the rate, amount, and timing of irrigation-water application in order to reduce soil erosion, runoff, and fertilizer and pesticide movement. An irrigation system should be designed to have an average application rate less than the infiltration capacity of the soil so that no surface pooling will occur and maximum efficiency of water percolation will occur.

Biological control of pests -- use of natural pest enemies as part of an integrated pest management program. While biological controls are limited, they should be included in a management program whenever practicable.

Pesticide selection -- selecting pesticides that are less toxic, less water soluble and less volatile. All pesticides selected for use should be screened for their potential to be sources of nonpoint pollution. Where necessary, restrictions should be placed on the timing, amount, and areas of application for each material.

Correct application of pesticides -- spraying when conditions for drift are minimal. Avoiding application when wind may blow pesticides from point of application or heavy rain is forecasted. Irrigate with appropriate volumes of water. Use surfactant or wetting agents when specified. Granular applications should be targeted away from impervious surfaces and bodies of water. Proper calibration of equipment should be checked before pesticide application.

Correct pesticide container disposal -- following label directions for pesticide container disposal.

This project provided a manual, "Turfgrass Best Management Practices for Protection of Water Resources" for the Commonwealth of Kentucky. Management techniques recommended in the manual are designed to reduce adverse impacts on the water resources of the Commonwealth.

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